Dear Jean-Pierre,

I enclose a revised version of the paper I co-authored with Bagonis and Clifton. We are very grateful to Clifton for his detailed comments and have tried to make our position clearer in the new draft. In particular may refer to his detailed queries as follows.

Part 2. A and B. I accept both step recommendations

Part 2. cont'd The idea behind our idea of a global contradiction can best be illustrated by the analogy of an arms tug-of-war. If two nets are needed, one from each team the situation (of equilibrium) is not changed but this is not the right criteria for deciding whether each man in the original set-up is necessarily involved! The test for that is whether that removing any one man leaves the equilibrium! I have suggested the test to make it clear that if eliminating any of justifiable reasons the contradiction for the calculation is global in the relevant sense.

Part 3 A, B and C I tend to endorse the first two alternatives to try and deal with the various factors. If I am trying to encapsulate the following points.

(1) $N \to \infty$ is neither necessary nor sufficient for a classical limit in all cases.

MV

It depends what sort of limit one is discussing. E.g. if $N \to \infty$ is combined crudely with mass $\to \infty$ then the localization of the center-of-mass between classically is output of an infinite flow diffusion of a localized wave-packet, but not an object of entanglement with a microsystem, as in Schrodinger cat paradox!

(2) But in some cases $N \to \infty$ does seem the right way to model classical behavior. The Jona and Lasinio's infinite limit can be viewed as an infinite number limit of a chain of Fradkin-Hepp particles, and Hepp's model of classical measurement in terms of an infinite spin chain is another example.

(3) There is quite content that the admitted fact that infinite systems can in other words behave classically - quantum-mechanically e.g. intercombinant or superficial to thermodynamic limit.

(4) The discontinuous behavior of ~~ED~~ localized Renormalizations as $N \to \infty$ does not, however, contain nonlocality directly in a physically observable limit but ~~as such Hepp tries does not~~ to model classical behavior.

and we know that the medicated
basis for the discontinuation or de-
non-availability of the dysfunction related
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I will be invited to join
your team as the record
treatment.

best of wishes

New ending for classical limit paper

~~We turn now to consider how global nonlocality behaves as $\hbar$ increases to infinity~~. It is a general feature of quantum systems that the approach to classical behaviour, as $\hbar$ becomes zero, ~~as $\hbar$ becomes infinite~~ becomes discontinuous. However small $\hbar$ becomes quantum behaviour persists, manifesting itself on a microscopic length scale typically of order of the de Broglie wavelength $\hbar/mc$, where m is the mass of the system. It is only when $\hbar$ actually equals zero that quantum mechanics reduces to classical mechanics. The same is true of the infinite spin limit of the Bell inequality investigated by Eberhard (1982). However large the spin becomes the range of angles over which an appropriate generalized Bell inequality is violated remains finite. We can think of the infinite spin limit as an infinite number limit of a chain of parallel spins. The Eberhard results for parallel the case of an infinite chain of measurement interactions in producing classical measuring behaviour. As shown by Bell in effect, Shimony in his (1972-1975) it is only by making the number n of steps in a measurement chain $\hbar$ actually infinite that the Bell model of classical measurement behaviour can be made to work. Just as actual physical systems are not actually macroscopic classical systems do not actually contain an

Ensemble

~~and the expired detention court. The mode when the number of particles is extremely infinite.~~

II Of course ~~even infinite large~~ classical physical systems with a infinite large number of particles may well display quantum behaviour as in the case of superconductivity or superfluidity in the thermodynamic limit while systems with a finite number of particles in appropriate circumstances may behave classically. So $N \to \infty$ is neither sufficient nor necessary for classical behaviour. Each property must be looked at separately to see how its behaviour depends on N. Our understanding includes the fact that ~~matter~~ generally occurs contradictions below. as $N \to \infty$.

U Newman (1990) has also investigated the N dependence relation of locality and demonstrated ~~the expected growth~~ correct that grows exponentially with N.

infinite number of particles it can
be argued that real physical systems
never satisfy the requirements for classical
behaviour in the strict sense ~~[~~ ~~exact of all possible~~ ~~]~~. # The wall
from. results are beautifully illustrated
2 to Szanalczyk Norman ~~Rockwell Irving Cornbleet~~ ~~All Rights~~. Harvard
Corp. N Leaches. Global, noticeably
remain manifest. ⊙ It is only in
the unrealizable limit of a truly
infinite number of particles that
global violations. ~~The~~
~~mathematical reason for this is~~
~~that [the quantum distinction between~~
~~two and that cannot be made when~~
~~the number of particles is actually infinite]~~
→ ~~the formulation of global particularity~~
~~can be made for N other than or~~
~~odd integral type N may be put~~
~~decades' on they able to yield~~ ~~Einstein~~ *
~~to distinct values one and the~~
~~.~~ ~~The Exclusion of our dynamics~~ (Von K)
~~in line with the binary results~~
~~should in the limit of all 3.~~
~~that macroscopic bodies' orbital~~
~~global quantal factors that can~~
~~only be those to deal that in our~~
a ~~real systems in realizable classical~~
~~limit.~~